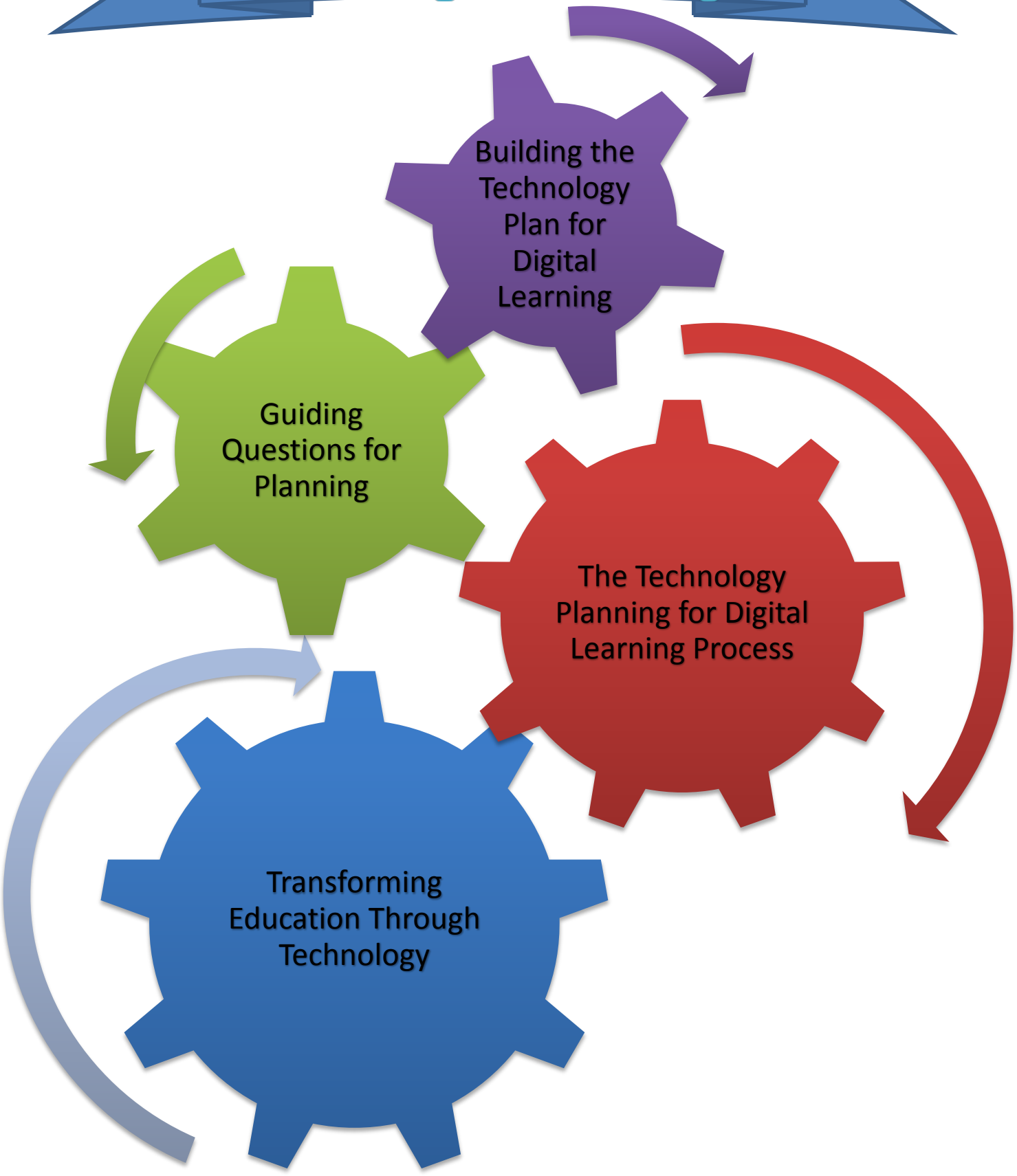
Technology Planning for Digital Learning



Technology Planning for Digital Learning

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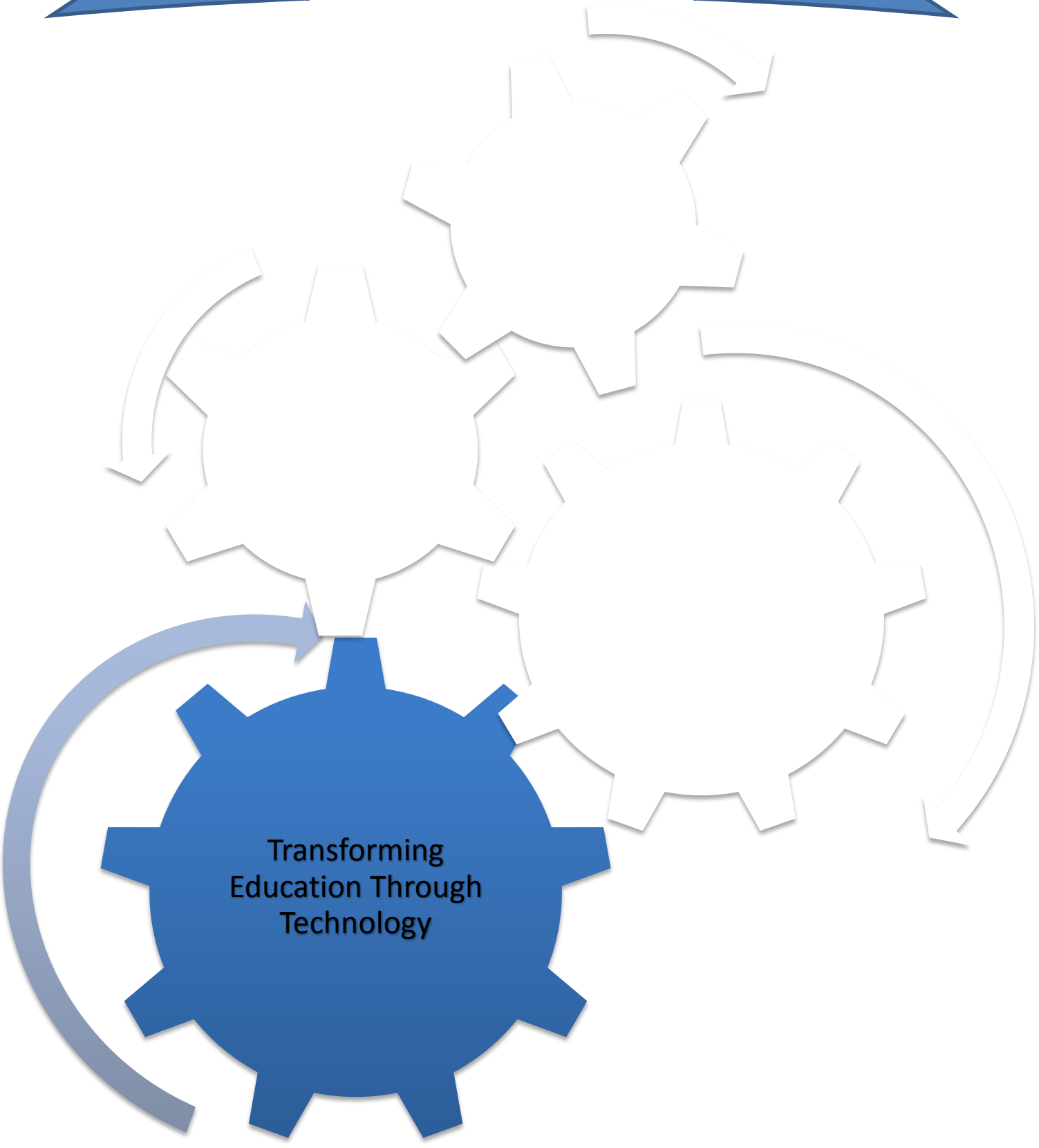


NJ Department of Education
Division of Innovation
Office of Educational Technology

SECTION 1: TRANSFORMING EDUCATION WITH TECHNOLOGY

There is a major transformation occurring in PK-12 education that is dependent upon the effective use of technology in governance, teaching and learning. This transformation necessarily includes the implementation of a digital learning environment. This document provides a full spectrum of options and guidance for a Local Education Agency (LEA) to facilitate the progression of digital learning for all students.

The NJ Department of Education's Office of Educational Technology (OET) has several inter-related initiatives that are designed to provide resources and tools to assist LEAs in their transformation to provide digital learning for all students. It includes support for implementing NJ Core Curriculum Content Standard (NJCCCS) 8.0, guidance on obtaining affordable broadband for an LEA, and the NJTRAx PARCC Technology Readiness and Digital Learning System. Additional information may be found at: MSRESC NJ DRLAP Broadband Component Project[1] and NJ Digital Learning website.

Planning for effective use of technology in an educational institution is necessary to maximize its educational benefit for the students as well as for administrative productivity within the district or school. New technologies and research-based, technology-infused learning models are emerging, and should be investigated by LEAs for possible adoption to remain current so that all students are prepared for life beyond PK-12 education. As Steven Anderson says, "… it can be more effective and meet more desired outcomes if we step back and consider what we are doing, why we are doing, how we will get there and how will we know we've arrived."[2] This guidance document is designed to assist in that planning process at the district and school levels, and is directly aligned to the National Educational Technology Plan (NETP).

The NETP provides an overview of progress made in the United States in leveraging technology to transform learning in a variety of ways.[3] Transforming learning has begun, and all NJ LEAs will be part of the transformation.

The NETP

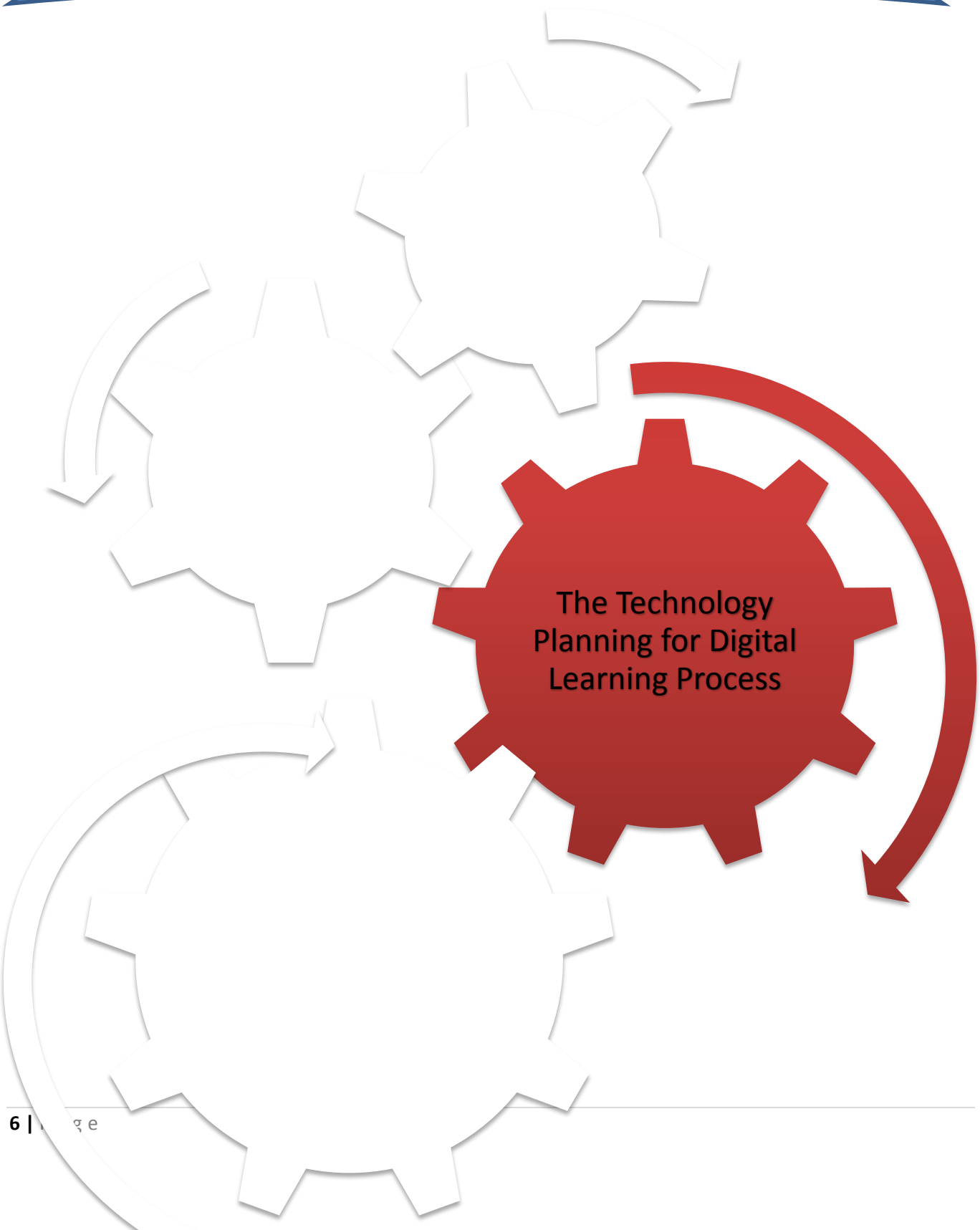
> "Focuses on using technology to transform learning experiences with the goal of providing greater equity and accessibility…
>
> When carefully designing and thoughtfully applied, technology can accelerate, amplify, and expand the impact of effective teaching practices. However, to be transformative, educators need to have the knowledge and skills to take full advantage of technology-rich learning environments. In addition, the roles of PK-12 classroom teachers and post-secondary instructors, librarians, families, and learners all will need to shift as technology enables new types of learning experiences.
>
> For these systematic changes in learning and teaching to occur, education leaders need to create a shared vision for how technology best can meet the needs of all learners and to develop a plan that translates the vision into action."[4]

Please note there are many tools available to assist the LEA/school in developing a useful digital learning plan. Some of the options are:

- *The Guide to Implementing Digital Learning* by the State Educational Technology Directors' Association (SETDA),
- *Transforming Schools* by the Northeastern Regional Information Center (NERIC),
- *Future Ready Schools: Preparing Schools for Success* by The Alliance for Excellent Education, and
- *Building Your Roadmap to 21st Century Learning Environments* through a partnership of Cable Impacts Foundation, P21, and SETDA.

This document is another such tool that leads the LEA toward the vision of the OET and the National Educational Technology Plan (NETP).

Technology Planning
for Digital Learning



SECTION 2: TECHNOLOGY PLANNING FOR DIGITAL LEARNING PROCESS (2016-2019)

INTENDED OUTCOMES

The overarching outcome of the LEA Technology Planning for Digital Learning process is to be a reflective tool on how the LEA can systemically transform instruction through the development or enhancement of effective implementation of digital learning. Effective implementation can improve student academic achievement, digital literacy, and the administration of online assessments. In addition, we know that non-cognitive competencies enable students to "thrive in an increasingly complex world". Technology can be used to develop and evaluate these "soft skills".[5]

This planning document will also identify ways to support LEA stakeholders including students, teachers, parents/guardians and administrators. Resources are included throughout the document to assist in providing a clear process for planning.

IMPORTANT TO NOTE

- This planning guide is voluntary for LEAs. Technology plans are no longer required by state or federal statutes, but it is strongly recommended that districts create and follow technology plans, in order to meet the technology demands of digital learning and PARCC assessments.
- We strongly recommend using this guide because it is aligned to the federal and state laws, policies and initiatives. It would behoove LEAs to consider using this planning tool to achieve long-term technology-related goals.
- The LEA's Technology Plan for Digital Learning that will be **developed in Section 4 of this guidance** (referred to as "The Plan" in this document) supports Standard 8.0, comprised of 8.1 Ed Tech and 8.2 Technology Education, Engineering, Design, and Computational Thinking - Programming and the implementation of the NJ Core Curriculum Content Standards (NJCCCS), and online assessments.
- For the purposes of this document, "district" refers to any public LEA, Charter School or Renaissance School in NJ.
- For the purposes of this document, PARCC technology readiness is a component of digital learning readiness.
- The Plan focuses on planning at the school level, not only the district level.

- The Plan may be submitted in any format that will effectively address the questions, or as required by the district's County Office of Education.
- Professional Development is referenced as Professional Learning.
- We strongly recommend that NJTRAx Digital Learning surveys be taken by LEA staff in order to generate reports that provide information on the district's digital learning readiness. These NJ tools are used to inform the decisions made in the technology planning for digital learning process. Contact your district NJTRAx master user for information regarding NJTRAx Digital Learning surveys and reports.
- Equitable access for students covers three areas:
    - students are able to use the Internet and devices across the school day in the instructional setting;
    - the instructional environment (chairs, tables, lighting, etc.) provides all students a comfortable area to work and participate in all activities;
    - similar or the same technical functionality as that in the instructional environment is available for students outside of the school day, also referred to as the "digital use divide"[6] or "homework gap", where homework requires Internet access by students who do not have Internet access OR are not allowed to use the Internet at home.[7]

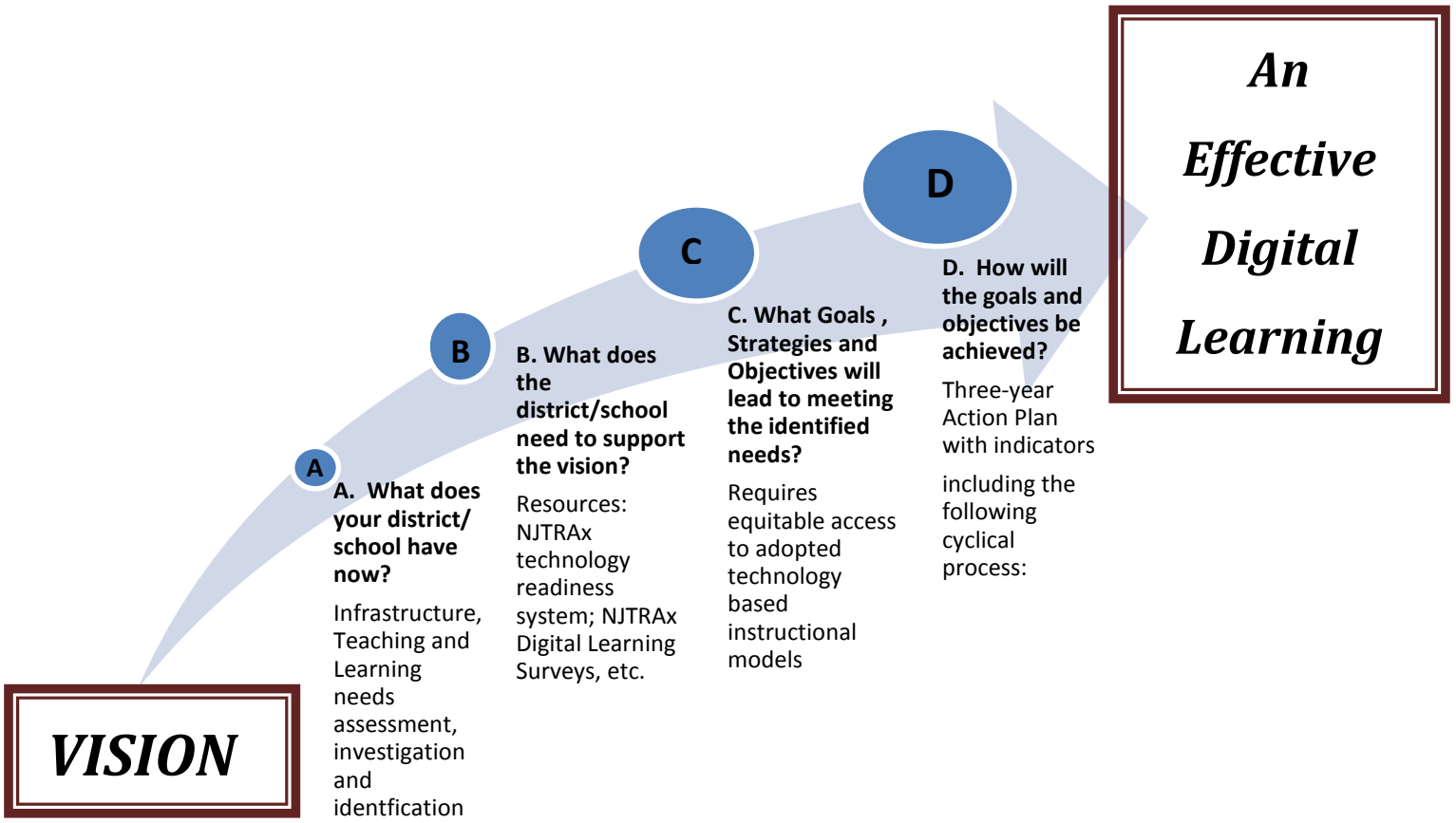
PLANNING GIVENS

There are many components of effective planning for the use of technology within an LEA. In reflecting on the areas below, **it is expected that the items are currently in place or in the process of being in place in every LEA in NJ.** The technology planning for digital learning process will move the LEA beyond implementing the items noted below.

- LEAs are expected to have aligned across content curricula to Standard 8.0 (which is 8.1 and 8.2) by fall 2015.
- The goals included in The Plan are aligned to and support students meeting Standard 8.0 indicators.
- NJTRAx PARCC Technology Readiness database is updated.
- Resources are available for teachers that reflect scientifically-based research and promising practices focused on improving student achievement.
- The development and utilization of innovative strategies for the delivery of specialized or rigorous academic courses and curricula through the use of technology are encouraged by the administration. (Examples of innovative strategies are found at InnovateNJ.) All students have access to take online PARCC and/or DLM assessments.

- Policies and procedures related to maintenance of hardware, software, infrastructure and security are in place and documented for all to review.
- Policies for accessing equipment and resources are in place and documented for all to review.
- Policies (in existence or pending) are available that determine or monitor how technologies are to be used by students, staff and community members. They cover the expectations of use of technology and access to resources. These policies cover after-hours or extra-curricular activities involving technology resources.
- Classroom technology management for the teacher is focused on learning rather than troubleshooting technology issues. Adequate technical support is available to the classroom by technical (IT staff) and non-technical people (students, parents, volunteers - "how to" sheets may be available to help troubleshoot and resolve issues.)
- Professional learning opportunities are available for administrators and teachers specifically for the purpose of increasing effective integration of technology into instruction. This should also be tied to the School and District Professional Development Plan.
- The LEA's Technology Plan for Digital Learning is reviewed and updated on a yearly basis by a diverse group of stakeholders from the LEA community. See Appendix C for a list of stakeholders.

Technology Planning For Digital Learning Process- General Overview



For A. and B. consider:

Leadership,

District and School Level Infrastructure (connectivity, facilities), Technical Support and Policies

District and Building Culture for Technology Infusion

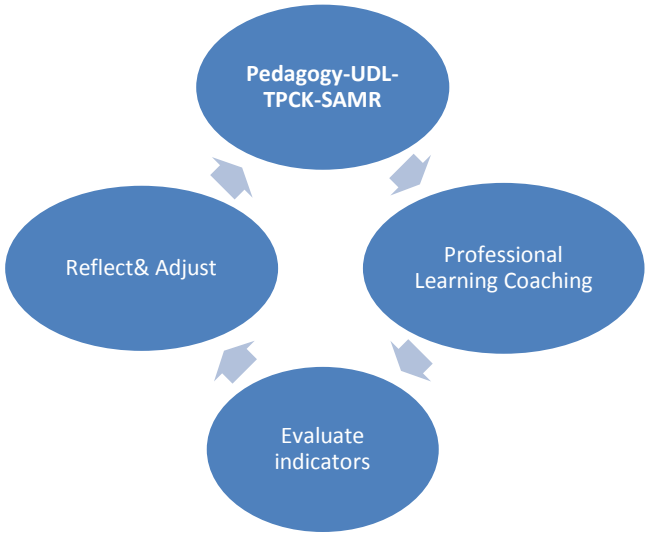
Curriculum Alignment to Standard 8.0--consider TPCK, Innovation, UDL, SAMR, Daggett System

Assessment

Professional Learning

Transformational Budgeting

For D. consider the following cyclical process:



(See *Appendix I* for a more detailed graphic)

About this Document

A. There are two parts to Technology Planning for Digital Learning: District Level & School Level. Each part has guided questions in one of two categories: **Basic Expectations** which are found in an emerging digital learning environment and **Expansion Considerations** which are found in a digital learning environment.

B. The questions are intended as guidance in creating or enhancing digital learning in all schools. The submitted *Technology Plan for Digital Learning* (developed in section four of this document) should provide an overview of the focus and work by the district over the next three years.

C. It is expected that the submitted *Technology Plan for Digital Learning* (developed in section four of this document) will reflect responses to the questions from the **Basic Expectations** sections, *as a minimum*. Districts are encouraged to provide a wider view of their district by including their responses to the **Expansion Considerations** questions, if applicable. All Basic Expectations questions are found in Appendix B.

D. The district could consider identifying specific schools to focus efforts for effective digital learning over the next three years (September 2016-June 2019) and expanding to the remaining schools after 2019 if unable to do so during 2016-2019.

E. The district could use one or more of the sample planning templates in Appendix D, E or F (or any other format) to illustrate the overview of the three-year Technology Plan for Digital Learning.

Submission Process

A. Submit the *Technology Plan for Digital Learning Components Checklist* in Appendix A that lists all of the components of the Plan. The checklist is an aid to the district that ensures all necessary components of the plan are submitted.

B. Submit the *Stakeholder Form* in Appendix C with the printed and signed name of each person on the planning committee, and their title. Signatures are required by the school principal, a teacher, parent/guardian, and person responsible for coordinating school-based technology infusion (i.e., technology coordinator). Invite the community, educators, students, parents/guardians to participate early and often in planning. All stakeholders should feel that they are accountable for the success of the plan.

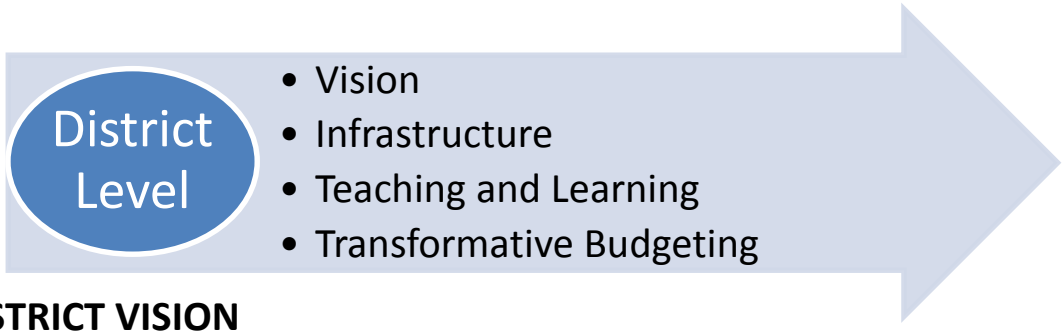
C. Save the completed planning template (from Appendix D, E or F, or any other format) that illustrates the overview of the three-year Technology Plan for Digital Learning for each of the schools impacted over the next three years. Use as many forms as needed.

D. Save the plan using the following naming convention: county code-district code-district name-2016 Tech Plan.

E. Submit the Technology Plan for Digital Learning to your County Office of Education according to their established submission process.

Technology Planning
for Digital Learning

Section 3: Guiding Questions for Planning



I. DISTRICT VISION

VISION – A vision is an overview and a mission statement. A vision expresses thoughts about what the LEA's future technology-rich educational environment will look like. The vision statement should be written in broad terms and guide the development of the digital learning plan.[8] Samples are available in the Technology Planning Resources section in this document.

Basic Expectations

1. Is there a **vision** for digital learning in the district that is shared among all stakeholders?

Expansion Considerations

2. Do all instructional settings **have what is needed for an effective digital learning environment** in terms of infrastructure, bandwidth, devices, onsite technical and teacher infusion of technology support, teachers who can facilitate technology thinking and usage in the content area, and assessment of student technology preparedness?

   Consider Innovation!

   a. Are there **non-traditional options for scheduling and course offerings**? [9]
   b. Are teaching and learning **instructional materials scaffolded to eliminate barriers** to all general education courses for any student to have full access to the curriculum and active participation in instructional activities?
   c. Is there someone in the district who **stays informed about model programs and initiatives** as it relates to a technology-infused curriculum?
   d. Does the **district connect to learners' homes** so that learning in the connected schools does not end when the students leave the school for the day?
   e. Do educators understand and/or are able to be **stewards of student data** so that only those with lawful access to the data can access it?
   f. Has the district created an environment that **supports risk taking and innovation** while maintaining accountability?
   g. Are there **key policies and practices that have or will be changed** to transform the school or district into a digital learning environment?

II. DISTRICT INFRASTRUCTURE

If NJTRAx Technology Readiness system was updated within the 2015-2016 school year**, click here to skip ahead** to the next section III. TEACHING AND LEARNING IN THE DISTRICT.

If NJTRAx Technology Readiness system was not updated during the 2015-2016 school year, **continue** in this section to begin building the Technology Plan for Digital Learning.

INFRASTRUCTURE[10]

Basic Expectations

1. **Is there an existing robust technological infrastructure** that meets current connectivity goals and that can be augmented to meet future demand that is at least 100 KB per student external connection for each 1,000 students and 1000 KB per student internal connection scalable up to 1 GB Ethernet or 1,000 MBPS?
2. Is equipment **scalable**, such as firewalls, switches and routers that form the backbone of both wired and wireless networks?
3. **Is equitable access to technology and connectivity** available to all students within the school grounds?
4. Is there **efficient routing** of information between internal users and external resources?
5. Is bandwidth and current **Internet usage tracked**?
6. Is there **ongoing coordination** when ordering new technologies and maintaining technology between the maintenance department within the district, the lead persons for both educational technology and assistive technology, and all principals?
7. Does the district have **security software** to manage potential hacks, viruses, etc.?
8. Is there a **security system(s)** in place to determine who can automatically enter a district building (i.e., Access control systems, taped video security or proximity readers)?
9. Is there **digital citizenship support** and education available for staff and students?
10. Are the needed **technical solutions** to support the educational environment, both academic and administrative identified and addressed?
11. Are **IT resources maintained** by a reliable and responsible person or firm? For those districts that need additional technical support, does the district collaborate with other districts for shared services to ensure onsite assistance available for online assessments?
12. Considering all network equipment (security cameras, wireless devices, desktops, all ports), does the district document all infrastructure setups and IP address schematics?

Expansion Considerations

13. Is there an **anytime/anywhere learning** environment?
14. For Bring Your Own Device (BYOD) environments, are **management policies in place**?

III. TEACHING AND LEARNING WITHIN THE DISTRICT

If the Future Ready District Level summary report was generated within the 2015-2016 school year include a copy of the district report with the Plan submission, and click here to **skip ahead** to the next section V. SCHOOL INFRASTRUCTURE.

If the Future Ready District Level Report was not generated during the 2015-2016 school year, **continue** in this section to continue building the Technology Plan for Digital Learning.

CURRICULUM, PEDAGOGY, TEACHING, LEARNING, AND ASSESSMENT[11]

Basic Expectations

Curriculum, Teaching, Learning and Assessment

1. Do students **collaborate with peers and create original deliverables** as an outcome?
2. Do students **critically evaluate their work and peer work** for continuous improvement?
3. Are barriers **identified that impede teachers** in effectively infusing technology into instruction?
4. Are teachers **infusing standard 8.2 concepts** within their lessons?

   NOTE: One useful way to think about Standard 8.2 is to look carefully at one particular strand, Standard 8.2C: Design. In this strand, the purposeful analysis of steps in any process to accomplish any goal or set of goals is the focus. The conscious and deliberate design process (analysis, trial and error, assessment and redesign, more trials and revision) is a uniquely human capability, and fostering this capability in all students is a critical part of education in the 21st century. The technology standards offer teachers a path to incorporate this kind of deliberative thinking in much of what students do in order to learn how to critically read and understand in any subject, write convincingly across the curriculum, and use mathematics and science to understand how things work or might work better.

Pedagogy

5. Do students learn from one another, from the teacher and **from resources available outside the school walls**?
6. Considering the district's vision for student learning, do teachers know about the technologies that will help make this type of learning more achievable and through what **pedagogical design**?

   NOTE: There are many models to guide an LEA in developing professional learning plans for teachers. The Technological Pedagogical Content Knowledge (TPAK or TPCK) framework focuses on the equal intersection of pedagogy, technology and content knowledge for teachers to increase effective integration of technology. The **S**ubstitution **A**ugmentation **M**odification **R**edefinition (SAMR) model continues the approach by allowing teachers to gauge their progress in how technology is utilized in instruction. Universal Design for

Learning (UDL) provides the "how" to engage all students that looks at ways technology is used in learning. NJTRAx Digital Learning surveys provide a quantifiable gauge for a school as a whole, but not an individual teacher. Teachers can gauge their own progress as they continuously improve their digital learning implementation skills. Then there is the Daggett Model for Effective Instruction. It "leverages more than the teacher in the classroom. It emphasizes vertical alignment—with organizational systems and structures and with instructional leadership—and horizontal alignment—with teaching colleagues and classroom resources—as keys to student success."[12]

Assessment[16]

7. Are **multiple means used by students to demonstrate learning**?
8. Do students have **digital portfolios** to maintain online collections of their work and objects?

Expansion Considerations

9. Is **learning personalized and differentiated** for each student based on his/her proficiencies, learning styles and interests?
10. Are **activities interest-driven and span contextual boundaries?**
11. Are teachers given adequate time, freedom and resources?
12. Do students create learning contexts for themselves within and across different content areas?
13. Do **teachers facilitate learning and look to students for answers** as much as students look to teachers for guidance?
14. Do teachers have **opportunities to share information, processes and research** that contribute to effective use of tech infusion?
15. Are **innovative practices encouraged** to support equity and reduce performance gaps based on race, national origin, gender and physical or mental disability?

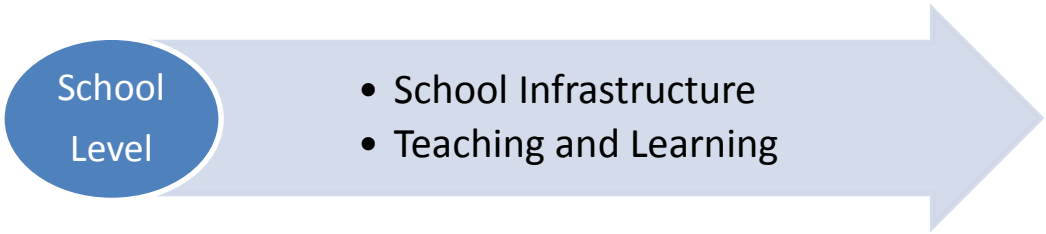
IV. TRANSFORMATIONAL BUDGETING

Basic Expectations

1. Is the **monetary source** for all upcoming purchases identified?
2. Are the funding sources for recurring services, anticipated purchases, and professional learning (include the technology resources to support the district's technology initiatives) **over the next three years identified**?
3. Does the district have a system in place to determine if what is purchased is actually **being used appropriately**?
4. Is the district using **innovative ways to fund** educational technologies?

Expansion Considerations

5. Is zero-based budgeting utilized?



V. SCHOOL INFRASTRUCTURE (for each identified school)

If NJTRAx Technology Readiness system was updated within the 2015-2016 school year**, click here to skip ahead** to the next section VI. TEACHING AND LEARNING (for each identified school).

If NJTRAx Technology Readiness system was not updated during the 2015-2016 school year, **continue** with the C. INFRASTRUCTURE section to continue building the Technology Plan for Digital Learning.

INFRASTRUCTURE[13]

Basic Expectations

1. **Is a robust technology infrastructure established** (bandwidth, Internet connectivity, number of devices for testing, switches, WAPs, etc…) that meets current connectivity goals, meets the PARCC online assessments recommended specifications, and that can be augmented to meet future demand for a digital learning environment?
2. **Is there equitable access to technology and connectivity** in all instructional settings for all students? Equitable access includes elimination of cultural gaps, opportunity gaps, barriers obtaining teaching and learning resources, and digital device gaps.
3. Based on the needs assessment, is there a determination as to **what needs to be upgraded** (consider the issues noted in the question #2 above)?
4. Is there on-site **maintenance and tech support**–current and proposed– available to meet the district's educational goals, and to manage and maintain the district computing environment?

VI. TEACHING AND LEARNING (for each identified school)

If the NJTRAx Digital Learning surveys summary report was generated include a copy of the report with the Plan submission and click here to **skip ahead** to the next section BUILDING THE TECHNOLOGY PLAN FOR DIGITAL LEARNING.

If the NJTRAx Digital Learning Surveys Report was not generated, **continue** with this section.

TEACHING, LEARNING, AND ASSESSMENT[14]

Basic Expectations

1. Do school administrators **understand the difference** between relying on a "canned" software package for student learning content and teachers empowering students through the infusion of digital tools to teach with effective instructional pedagogy?
2. Are there **opportunities for teachers to gauge** **where they are** in preparing for or utilizing a digital learning environment?
3. Are teachers aware of and/or using **effective learning models**?
4. Are students **assessed for meeting Standard 8.0 in grades K-12**?
5. Do all students have ongoing **opportunities to collaborate with peers** in and outside of school?
6. Does the district have a system in place to assure students in grades 6 through 8 meet **Standard 8.0 by the end of grade 8**?

Expansion Considerations

7. Are **innovative practices** that support equity and reduce performance gaps (based on race, national origin, sex and physical or mental disability) encouraged?
8. Have all 14 **essential conditions** been met? If not all met, which ones do not have and why?
9. Do **changes need to occur within the school** **in** terms of physical, virtual and blended instructional design to promote collaboration, problem-solving, innovative thinking and creativity within a safe, sustainable, technology-rich environment?
10. Do **family members understand** the value of a digital learning environment?
11. Do students and **teachers have access to personalized learning experiences** supported by technology and professional learning for the effective use of data and technology?
12. Is **technology access ubiquitous** and used for learning in every instructional setting in the school?
13. Are **community leaders engaged** in making connections for students to the real world?
14. Are **specific strategies used** such as developing the growth mindset to motivate students to become technologically prepared? A growth mindset in people who believe they can develop their basic abilities fosters higher motivation and achievement than those who believe those qualities are fixed. It may assist in motivating students when fostered by teachers who help them set personal goals, encourage them to embrace challenge rather

than pursue easy tasks for the sake of "success", and give them a clear sense of their progress as they work toward mastery.

Consider Professional Learning!

The purpose of professional learning is effective continuous teacher education to help teachers reflect on their competencies and develop and enhance those competencies, and to keep current on the theory and practice to improve teaching and learning in the classroom. Professional learning methods must be diverse – not "sit-and-git", but stretching further into the classroom. The finds of two recent federally funded studies conclude that the current approaches to teacher training have no significant effect on performance. [15] The key is to set goals and measure impacts against those goals, and utilize a variety of support. See Appendix G for additional considerations.

1) Are specific research-based, ongoing professional learning opportunities provided to all staff to increase their proficiency in implementing, assessing and supporting a variety of effective practices for teaching and learning in a digital learning environment?
2) Do staff have ongoing professional learning that is personalized to each individual's teaching practices utilizing technology? Does the professional learning foster his or her progress toward the LEAs vision and expectations of digital learning in the classroom? Do teachers need assistance to implement strategies that incorporate content knowledge, skills and global literacy into learning?
3) Are teachers educated about the harms of copyright piracy?
4) Does the district provide formal professional learning opportunities for teachers to use data to improve student achievement, and understand how to protect individual student privacy in accordance with the Family Education Rights and Privacy Act (FERPA) and state and local policies and laws in the use of such data?
5) Are various models of ongoing, consistent professional learning used (i.e., peer review and critique of lesson, in-class modeling through coaching, grade level meeting sessions)?
6) Is there a formal mechanism in place for teachers to convey their professional learning needs?
7) Is there a process for assessing the effectiveness of professional learning of teachers, administrators and noncertified staff that is related to technology infusion?
8) Are there opportunities other than face-to-face for teacher professional learning with experts outside of the United States that is organized or facilitated by the district or school?
9) Is teacher professional participation on social media encouraged? If so, on what social medium?
10) Are professional learning opportunities provided to teachers in regard to assessing students on Standard 8.0 criteria, especially in regard to assessing 8.2 design process skills?
11) Do educators have the knowledge and resources to include exploratory activities throughout the day that include real and simulated situations that apply the design process and explore the relationship between various technologies and disciplines in society where the skills can be applied?
12) Are educators supported to scaffold instruction for all levels of learners including using digital tools? If so how?

Consider the Curricular level!

There are many tools to evaluate if digital environments are part of the curricula.[16]

1) Is there evidence throughout the curriculum that student learning must go beyond the skills of recognition, fact gathering and recall?[17] Is there a scaffolded, learner-directed school curriculum developed?[18]
2) Are systems in place to ensure students meet the applicable Standard 8 requirements at the top of their grade span?
3) Does the curriculum include effective infusion of technology into curricula and instruction?
4) Is support provided to teachers for developing effective lessons, and increasing personal skills in how to facilitate student use of technology at levels above the teacher's technology skill level?
5) Do teachers actively participate in Professional Learning Networks that are local, national and international? [19]

Consider Pedagogy within the classroom!

Michael Fullan says "Making digital devices available and helping teachers and students use them is the easy part—but it isn't pedagogy." TPACK website's says; "Effective technology integration for pedagogy around specific subject matter requires developing sensitivity to the dynamic, transactional relationships between these components of knowledge situated in unique contexts. Individual teachers, grade-level, school-specific factors, demographics, culture and other factors ensure that every situation is unique and no single combination of content, technology, and pedagogy will apply for every teacher, every course, or every view of teaching."

1) Is there a process to determine if there are accessibility barriers to content (evaluation tools, discussions within professional learning communities, etc...) or that may prevent learners from demonstrating what they know?
2) Do students with disabilities have their physical, academic and social needs addressed through technology?
3) Is student engagement assessed during the learning process?
4) If the technology was taken away, would the lesson's impact on students be different?
5) Are opportunities available that allows students to collaborate with or through the technology with others in and out of the school walls?
6) Do students have technology-based opportunities to create new knowledge or products (not recall)?
7) Are students taught to use meta-cognitive strategies to effectively collect information?

Technology Planning
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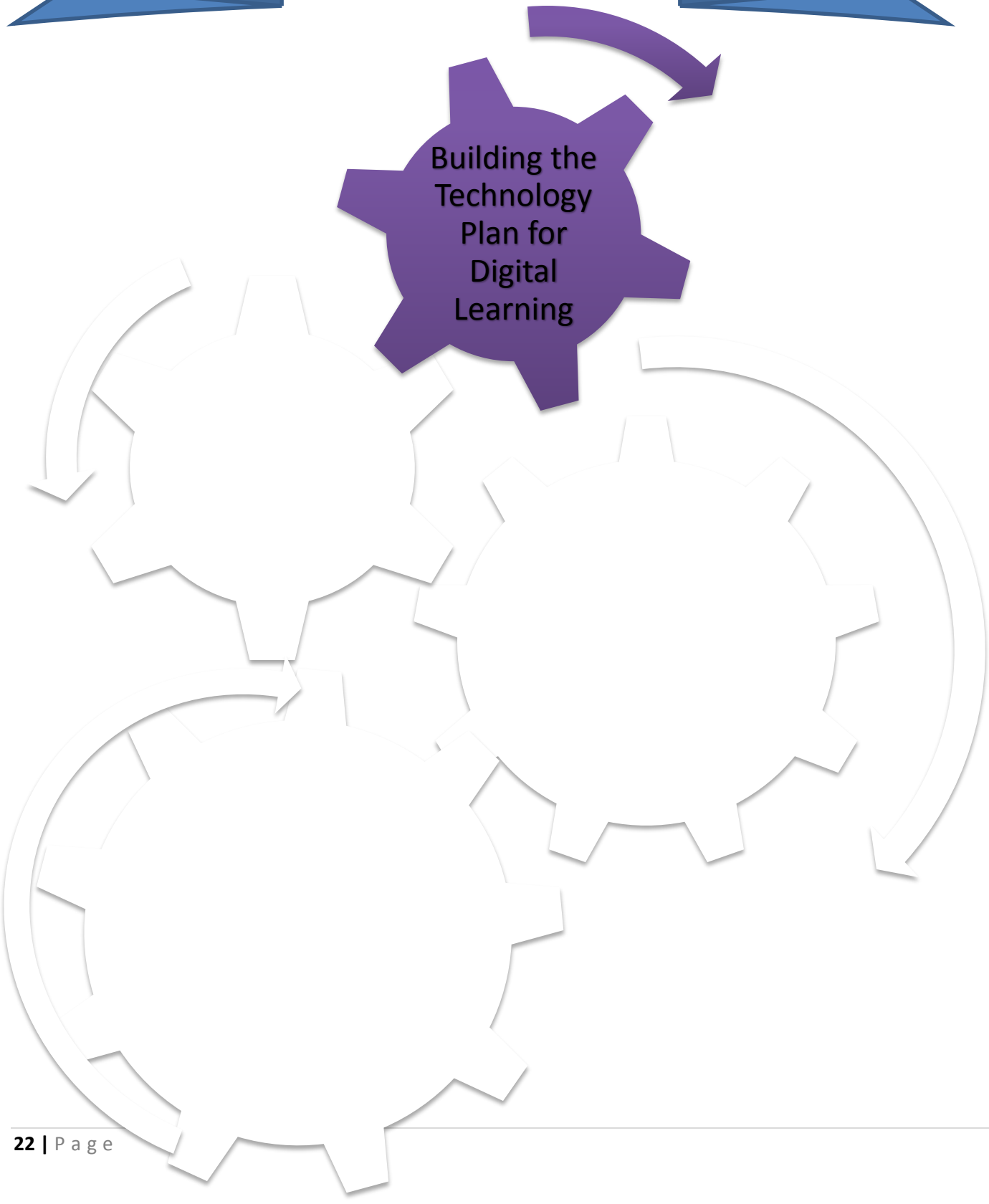


SECTION 4: BUILDING THE *TECHNOLOGY PLAN FOR DIGITAL LEARNING*

DISTRICT

What is the district's vision for digital learning over the next three years?

Indicate the last date NJTRAx Technology Readiness system was updated for the district:

If applicable, indicate the date the Future Ready District Level summary report was generated (include a copy of the district report with the Plan submission):

SCHOOL

If applicable, include a copy of the Digital Learning Survey summary report with the Plan submission for each identified school.

Name the identified school(s) that will be the focus for digital learning transformation over the next three years and the corresponding date(s) NJTRAx Technology Readiness system was updated for each school.

What are the current effective learning models in the school? Please provide the total number of classrooms, and learning models used (see definitions – for example: blended, 1 to 1, personal learning environments (PLEs), Massive Open Online Courses (MOOCs), and the flipped classroom. A sample list of learning models used in a digital learning environment is found in Appendix H.

NOTE: There are many models to guide an LEA in developing professional learning plans for teachers. The Technological Pedagogical Content Knowledge (TPAK or TPCK) framework focuses on the equal intersection of pedagogy, technology and content knowledge for teachers to increase effective integration of technology. The **S**ubstitution **A**ugmentation **M**odification **R**edefinition (SAMR) model continues the approach by allowing teachers to gauge their progress in how technology is utilized in instruction. Universal Design for Learning (UDL) provides the "how" to engage all students that looks at ways technology is used in learning. NJTRAx Digital Learning surveys provide a quantifiable gauge for a school as a whole, but not an individual teacher. Teachers can gauge their own progress as they continuously improve their digital learning implementation skills. Then there is the Daggett Model for Effective Instruction. It "leverages more than the teacher in the classroom. It emphasizes vertical alignment—with organizational systems and structures and with instructional leadership—and horizontal alignment—with teaching colleagues and classroom resources—as keys to student success."[20]

Please complete all five sections A through E for each identified school.

A. Goals/objectives/strategies - considerations when developing the goals, objectives and strategies

The plan must have clear goals. Begin the planning with a picture of the desired outcome. "The most effective way to design learning programs, lessons and schools is to plan with the end in mind."[21] Define what students should understand and be able to accomplish as a result of their school experience.[22] What should student work and performance look like? The next step is planning specific learning experiences for students (see *Implementation* sub-topic in the ***C. Action Plan*** section below). The statements below should help the school staff begin to reimagine or continue the work of transforming the school's physical, virtual and blended spaces to an effective digital learning environment for all students.[23] Much of the information noted below is shared from the "Top 10 UDL Tips for Assessment" by the Center for Applied Special Technology (CAST).

1. The identified digital learning needs connection to the district's vision and goals.
2. The goals should include the academic outcomes expected over three years for teachers and students.
3. The timeframe should reflect that the goals are measureable and manageable for the three-year time period.
4. Instructional materials, infrastructure, bandwidth, devices, assessments, and methods are in place to support the standards being achieved in all learning environments through effective instructional strategies.

B. Indicators to evaluate the Completion and Success of Goal(s) and Objective(s) - *considerations when developing the indicators*

An Indicator is observed or calculated to show presence or state of condition. The indicators and accountability measures for this plan are used to determine the extent to which the goal(s) and objectives are met. The evaluation process enables the district to monitor progress toward the specified goals and to make mid-course corrections in response to new developments and opportunities as they arise.

1. At the District level, indicators may include network uptime, help desk response times, electronic resource availability, successful deployment of new hardware and/or software systems, reduction in total cost of ownership, student to device ratios, classroom to device ratios, increased access to infrastructure, bandwidth, devices, etc.
2. At the school level, indicators may include teacher lesson plans with evidence of technology integration into instruction, student work demonstrating 21st Century skills, workshop and/or conference attendance data, etc.
3. The actions taken, if expected results are not met, feeds into the Action Plan below.

C. Action Plan – *considerations when developing the Action Plan*

1. The description of the activities is linked to goal(s), objective(s) and strategies.
2. The person(s) responsible for ensuring this activity will be completed (and may include the title of others who are crucial for completion i.e., a signature needed).
3. Time frame for activity to be started and completed (indicate "ongoing" if applicable).
4. Resources needed are tangible, evaluative deliverables that will prove the activity was accomplished.

D. Reflect and Adjust –*considerations when reflecting on progress of the implementation*

1. Identify barriers to attaining the goals and objectives related to assessments, materials or methods.
2. Students could be offered opportunities to reflect on the progress of the plan implementation as it impacts their learning experiences and goals.
3. The plan should build educator capacity to implement the necessary learning pedagogy and practices for student college and career readiness.
4. A systemic process should be identified when changes are made to the goals, objectives and strategies to improve outcomes.

E. Budget - *considerations when developing the budget*

1. The funding sources should be identified for recurring services, anticipated purchases, and professional learning (include the technology resources to support the district's technology initiatives) over the next three years.
2. An evaluation process should be embedded in the action plan to determine if purchased items are used appropriately.
3. The district and/or school may explore innovative ways to fund digital learning expansion to all schools.

Examples of a goal, strategies and objectives

Goal: Teachers of grades 4 through 7 in Main Street School will develop and implement a replicable, student-centered, digital learning environment across all NJ Core Curriculum Content areas by June 2019.

Strategies:

- An informed leadership team supports risk-taking by teachers to use technology innovatively for teaching and learning.
- Develop adjacent grade teacher teams to collaboratively work together.
- Provide ready access to sufficient human capital, technical and physical resources.
- Provide sufficient technical and infrastructure support.
- Provide high-quality, ongoing, professional learning targeted to technology-infused content for all staff members.
- Provide on-going, curriculum and instructional technology on-site support to teachers.

Objective: Grade 4 through 7 teachers increase the number of instructional lessons that demonstrate *proficient infusion of technological thinking and digital resources* throughout the school year.

Objective: The capacity, infrastructure, staffing, and equipment are available to *meet the teachers' and students' academic needs for effective and efficient operations* as evidenced by pre and post surveys.

Objective: Resources are available for all students, regardless of race, ethnicity, income, geographical location, or disability, so they can become *technologically prepared* by the end of eighth grade where the identified grade levels 4 through 7 are expected to reach moderate level (as evidenced by Standard 8.0 evaluation tool) benchmarks by the end of each grade year.

Objective: *A sustainability plan* is designed year one and implemented year two for current and future financing requirements to support the LEA's Technology Plan for Digital Learning.

(This list is not exhaustive; more objectives may be added.)

Technology Planning Resources

Standards

NJ Department of Education Technology Standards: http://www.state.nj.us/education/cccs/2014/tech/

Federal Law

Every Student Succeeds Act: https://www.gpo.gov/fdsys/pkg/BILLS-114s1177enr/pdf/BILLS-114s1177enr.p

DIGITAL LEARNING PLANNING TOOLS

Future Ready Tools – http://futureready.org/about-the-effort/dashboard/

A planning resource document is from the Northeastern Regional Information Center (NERIC) – www.neric.org. The document includes guidance for New York schools about meeting the Smart Schools Bond Act, which although does not pertain to NJ is helpful guidance on planning for Instructional Digital Learning and coincides with that of the Office of Educational Technology. We have pulled key components of their interactive document as guidance for NJ schools. http://neric.org/Smart_Schools/PDFs/Transforming_Schools.pdf.

CITEd **supports leadership** at state and local education agencies to integrate instructional technology for all students to achieve high educational standards. CITEd provides this support through identification of promising practices, innovative online technical assistance tools, Professional Learning, and communities of practice. Read more about CITEd's approach. CITEd - http://www.cited.org/index.aspx

State Education Technology Director's Association (SETDA) - **The Guide to Implementing Digital Learning (GIDL)** is a free web-based resource to support school and district leaders as they work to ensure that investments in digital learning spark positive results. GIDL includes six topic areas: planning, professional learning, content and software, broadband, devices and tech support. Each topic's section includes background information, key considerations for implementation, resources and exemplars of digital learning in action. See The Guide to Implementing Digital Learning – Overview (printable document), and also http://digitallearning.setda.org/planning/#!/overview.

Essential Conditions for technology integration -The International Society for Technology Education (ISTE) **Essential Conditions** are the 14 critical elements necessary to effectively leverage technology for learning. They offer educators and school leaders a research-backed framework to guide implementation of the ISTE Standards, tech planning and system wide change.

The SouthEast Initiatives Regional Technology in Education Consortium (SEIR*TEC) is a group of national, regional, and university-based organizations dedicated to promoting the use of technology to improve teaching and learning by providing technical assistance, authentic

professional development in the areas of curriculum and instruction, leadership for technology, policy, and planning and evaluation. See Technology Planning: http://ftp.serve.org/seir-tec/techplan.html.

Sample Vision and/or Mission Statements

- http://resources.sun-associates.com/visions.html
- http://www.bobpearlman.org/Learning21/Mission%20and%20Vision.htm

Budgeting for Digital Learning

- Transformative Budgeting: http://njdigitallearning.org/wp-content/uploads/2015/04/Transformative-Budgeting-final.pdf
- National Educational Technology Plan (NETP): http://tech.ed.gov/netp/leadership/, pp. 45-48.
- Pilot to purchase checklist by Digital Promise (www.edtechpilots.digitalpromise.org)
- Open Education Resources - *Leveraging open education resources to improve learning outcomes*: http://www.educationandcareernews.com/higher-education/leveraging-open-education-resources-to-improve-learning-outcomes
- A Teacher's Guide to OER - http://www.edudemic.com/guide-open-educational-resources/

PROMISING PRACTICES – USING TECHNOLOGY

Individualized Learning Including "The Padagogy Wheel"

- http://www.unity.net.au/allansportfolio/edublog/?p=1621
- http://www.unity.net.au/allansportfolio/edublog/
- http://www.edutopia.org/about

The SAMR (Substitution, Augmentation, Modification, And Redefinition) Model Examples:

- http://www.schrockguide.net/samr.html
- https://sites.google.com/a/msad60.org/technology-is-learning/samr-model
- http://blog.mimio.com/see-how-samr-works-in-real-classrooms

TPCK (TPACK)

- https://en.wikipedia.org/wiki/Technological_Pedagogical_Content_Knowledge
- http://www.tpack.org/

Personal Learning:

- http://tech.ed.gov/leaders/
- http://readingbyexample.com/2015/12/05/build-your-personal-learning-network-wti15/
- ISTE's Project ReimagineED - http://tinyurl.com/gkwk4x9

Engagement:

- http://www.edutopia.org/blog/golden-rules-for-engaging-students-nicolas-pino-james

Feedback:

Steve Wick, Technology Coordinator, School Level, Neuqua Valley High School in Naperville, IL says, "Praise alone is rarely effective feedback … to best help students teachers need to go beyond praise and connect the feedback directly to the learning goals whenever possible. Here are a couple of resources about effective feedback that goes beyond basic praise:

- Seven Keys to Effective Feedback
- Giving Effective Feedback"

ED TECH FOCUS ON K-12 SITE'S **ORIGINAL ARTICLE:**

http://www.edtechmagazine.com/k12/article/2015/12/6-ways-new-national-education-technology-plan-could-help-close-achievement-gap

RESEARCH

A meta-study from ARCC in the United States reveals that **technology, when appropriately used can make a significant difference in learning outcomes in all subjects**. The evidence from the various studies has a recurring theme that technology can improve student achievement if they are integrated appropriately into teaching and learning. When what technology can do best - offering online access, interactive capabilities and a vast range of options on content - is made available and meaningfully integrated into teaching, the results are undeniable.

A July 2015 annotated bibliography from the Center on Enhancing Early Learning Outcomes provides resources and information about **using technology in early education classrooms**. It includes considerations when introducing new tools, media, and devices, so educators and policymakers can make informed decisions about preparing teachers and care providers to use the technology.
http://ceelo.org/wp-content/uploads/2015/07/ceelo_annotated_bib_ece_tech_final_web.pdf

A research study at Durham University in the North East of England suggests that **multi-touch, multi-user surfaces can improve the learning of mathematics**. 400 children were involved in the study, which demonstrated that 'smart tables' enabled better collaboration and problem solving during math lessons. Class teachers receive a live feed of output from the children's interactions on the surface, and can intervene when necessary. Research has shown that the touch surfaces enable children to discover a range of alternative solutions to math problems, simply through interacting with each other in new ways.

Research has unveiled **instructional practices that are designed to help students with disabilities learn academic content in social studies and other secondary level subject areas.** (Jobs for the Future: Deeper Learning Research Series by Sharon Vaughn, Louis Danielson, Rebecca Zumeta and Lynn Holdheide, August 2015). Strategies include: a) students creating a "comprehension canopy (identify the field's big ideas and key concepts and over time, explicitly connecting them to specific examples and cases, b) defining essential words mean to assist students in learning and using the academic vocabulary of the discipline, and c) team-based learning in which students work independently at first, to demonstrate comprehension, and then with team members to build, correct, and extend learning about content-area issues." It is also strongly shown that students with disabilities needs teachers that provide supports that are "deliberate, explicit and systematic. Students have been found to outpace their peers studying the same content. The National Research Council (NRC) defines deeper learning as "the process through which an individual becomes capable of taking what was learned in one situation and applying it to new situations (i.e., transfer [of information])" (NRC 2012, p. 4) For example, a set of instructional practices that are specifically designed to help students with disabilities learn content in social studies and other secondary level subject areas is detailed in the publication "Deeper Learning for Students with Disabilities" (Vaughn, Sharon, Louis Danielson, Rebecca Zumeta, & Lynn Holdheide. 2015. *Deeper Learning for Students with Disabilities*. Students at the Center: Deeper Learning Research Series. Boston, MA: Jobs for the Future.)

Deeper Learning occurs through authentic relationships between teacher and student. Effective teaching and learning takes into account access for all students is a given and teachers and students work together to discover, create and master content.

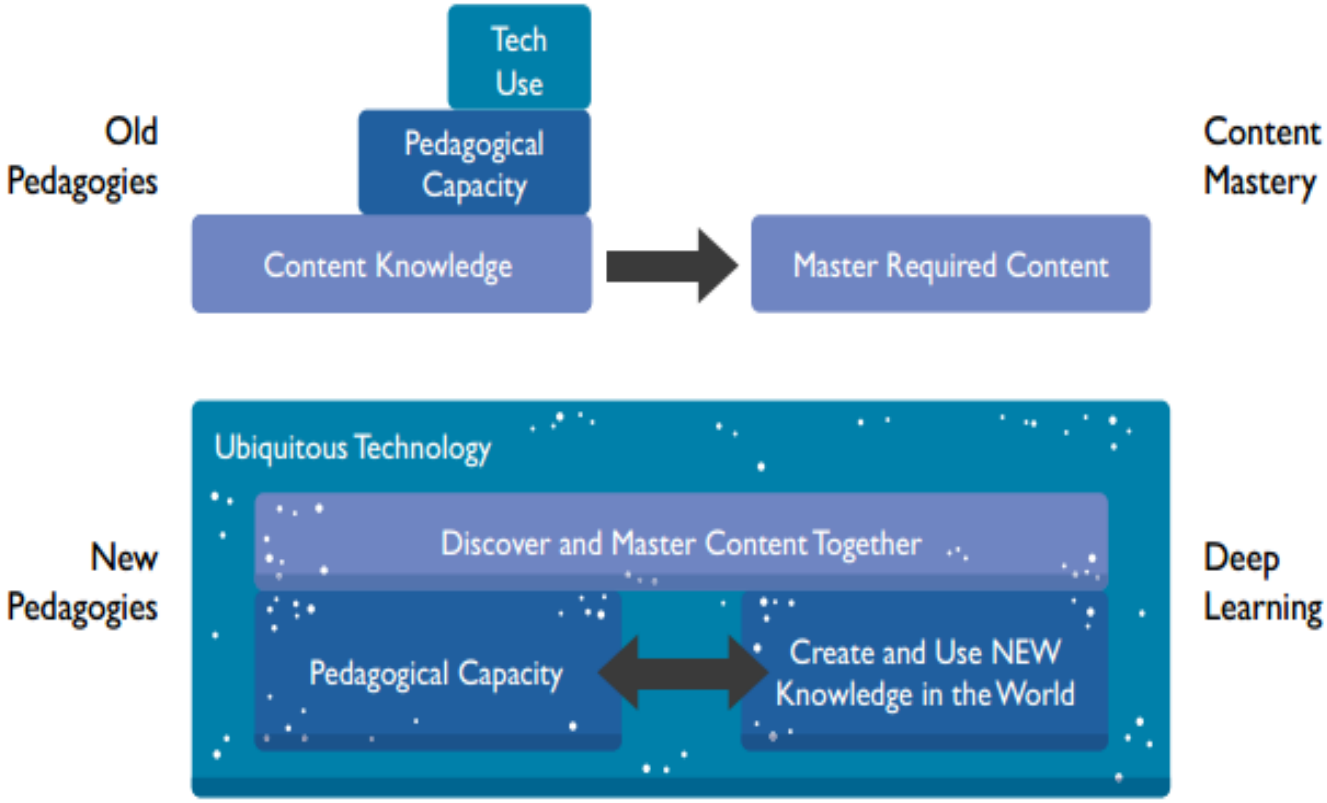


Figure from p. 3 of Fullan, M. & Langworthy, M. (2014) *A Rich Seam: How New Pedagogies Find Deep Learning*, London: Pearson.

APPENDIX A

Technology Plan components CHECKLIST

This form may be used to ensure all components are addressed in the submitted document for review.

School /Charter School/Renaissance School (SCHOOL NAME): **NJTRAx PARCC Technology Readiness Rating:** **NJTRAx Digital Learning Readiness Rating:**			
❖ If the Future Ready District Level summary report was generated within the 2015-2016 school year, include a copy of the district report with the Plan submission ❖ If the NJTRAx Digital Learning Surveys summary report was generated, include a copy for all identified schools			
STEP		**YES**	**NO**
1.	**District vision included.**		
2.	**NJTRAx technology readiness system for the district and for each school was updated.**		
3.	**NJTRAx DL surveys for each school were completed. GO TO STEP 5**		
4.	**School-based Goals, Strategies, Objectives and Indicators are included for each identified school.**		
5.	**Reflection and adjustment plan is included.**		
6.	**School-based plan for infusion of technology within instruction is clearly understood.**		
7.	**School-based Reflection & Adjustment is included for each identified school.**		
8.	**School-based budget is included to support activities in Action Plan.**		

"BASIC Expectations" Questions only

APPENDIX B

Basic Technology Plan Elements Districts Should Have In Place Already

VISION

1. Is there a **vision** for digital learning in the district that is shared among all stakeholders?

DISTRICT INFRASTRUCTURE

2. Is there an existing robust technological infrastructure that meets current connectivity goals and that can be augmented to meet future demand that is at least 100 KB per student external connection for each 1,000 students and 1000 KB per student internal connection scalable up to 1 GB Ethernet or 1,000 MBPS?
3. Is equipment scalable, such as firewalls, switches and routers that form the backbone of both wired and wireless networks?
4. Is equitable access to technology and connectivity available to all students within the school grounds?
5. Is there efficient routing of information between internal users and external resources?
6. Is bandwidth and current Internet usage tracked?
7. Is there ongoing coordination when ordering new technologies and maintaining technology between the maintenance department within the district, the lead persons for both educational technology and assistive technology, and all principals?
8. Does the district have security software to manage potential hacks, viruses, etc.?
9. Is there a security system(s) in place to determine who can automatically enter a district building (i.e., Access control systems, taped video security or proximity readers)?
10. Is there digital citizenship support and education available for staff and students?
11. Are the needed technical solutions to support the educational environment, both academic and administrative identified and addressed?
12. Are IT resources maintained by a reliable and responsible person or firm? For those districts that need additional technical support, does the district collaborate with other districts for shared services to ensure onsite assistance available for online assessments?
13. Considering all network equipment (security cameras, wireless devices, desktops, all ports), does the district document all infrastructure setups and IP address schematics?

CURRICULUM, TEACHING, LEARNING AND ASSESSMENT

14. Do students collaborate with peers and create original deliverables as an outcome?
15. Do all students have ongoing opportunities to collaborate with peers in and outside of school?
16. Do students learn from one another, from the teacher and from resources available outside the school walls?

17. Do students critically evaluate their work and peer work for continuous improvement?
18. Do school administrators understand the difference between relying on a "canned" software package for student learning content and teachers empowering students through the infusion of digital tools to teach with effective instructional pedagogy?
19. Considering the district's vision for student learning, do teachers know about the technologies that will help make this type of learning more achievable and through what pedagogical design?
20. Are multiple means used by students to demonstrate learning?
21. Are teachers infusing standard 8.2 concepts within their lessons?
22. Are teachers aware of and/or using effective learning models?
23. Are there opportunities for teachers to gauge where they are in preparing for or utilizing a digital learning environment?
24. Are barriers identified that impede teachers in effectively infusing technology into instruction?
25. Do students have digital portfolios to maintain online collections of their work and objects?
26. Are students assessed for meeting Standard 8.0 in grades K-12?
27. Does the district have a system in place to assure students in grades 6 through 8 meet Standard 8.0 by the end of grade 8?

BUDGETING

28. Is the monetary source for all upcoming purchases identified?
29. Are the funding sources for recurring services, anticipated purchases, and professional learning (include the technology resources to support the district's technology initiatives) over the next three years identified?
30. Does the district have a system in place to determine if what is purchased is actually being used appropriately?
31. Is the district using innovative ways to fund educational technologies?

Stakeholder Assurance

I agree to the contents in this educational plan, and the assurance that I will be involved in the implementation of this Technology Plan for Digital Learning. Involvement in the implementation of this Plan may include: reviewing the progress of meeting the goals and objectives, being responsible for completing one or more activities in the action plan, participating in the revisions of the plan. Stakeholders associated with the district and school levels (i.e., each principal from targeted schools) should sign.

Stakeholder Name	**Stakeholder Title**	**Stakeholder Signature**
	District Superintendent	
	Principal, School Name	
	Parent	
	Teacher	
	Technology Coordinator	
	Students	
	School Board member	
	Community Member	

Technology Plan Template

IMPLEMENTATION PLANNING – SCHOOL-BASED TABLE

APPENDIX D

School /Charter School/Renaissance School (SCHOOL NAME):
NJTRAx PARCC Readiness Rating: NJTRAx Digital Learning Readiness Rating:

Goal 1: [Insert goal here.]

Strategy: **Indicator(s):**

Objective:

Projects/Activities (include the steps required to ensure activity completion)	Person responsible for completion of activity and those responsible for reviewing or approving the activity to move forward	Timeline (mm/yr span)	Resources

Goal 2: [Insert goal here.]

Strategy: **Indicator(s):**

Objective:

Projects/Activities (include the steps required to ensure activity completion)	Person responsible for completion of activity and those responsible for reviewing or approving the activity to move forward	Timeline (mm/yr span)	Resources

Professional Learning

Goal No.	Initial Activities	Follow-up Activities (as appropriate)

Budget

Goal No.	Activity	Funding Source (Federal/State/Private/	Amount

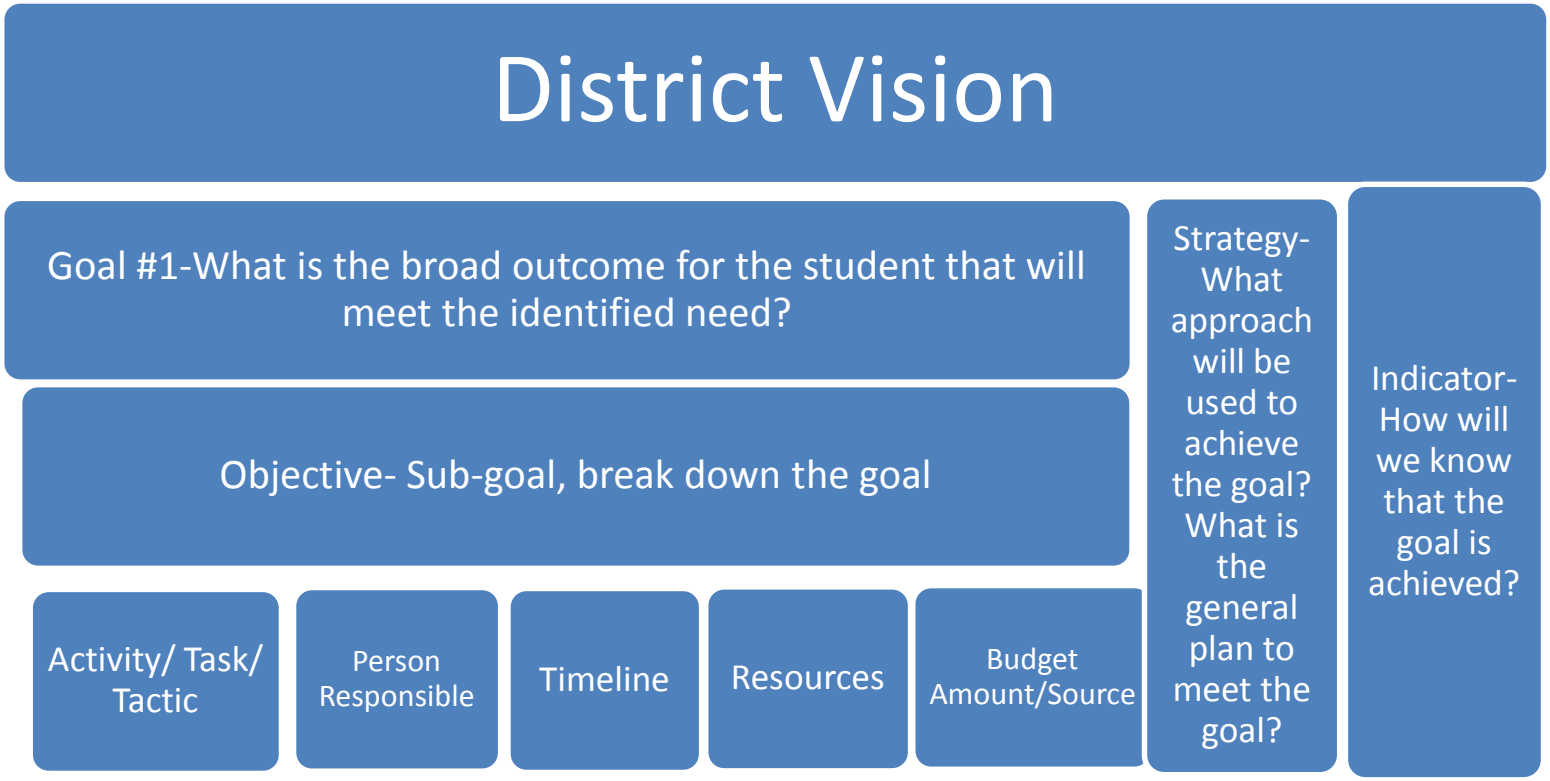
Technology Plan Template

GRAPHIC

School /Charter School/Renaissance School (SCHOOL NAME):

NJTRAx PARCC Technology Readiness Rating: **NJTRAx Digital Learning Rating:**

APPENDIX E



Technology Plan Template

NARRATIVE

APPENDIX F

School /Charter School/Renaissance School (SCHOOL NAME):

NJTRAx PARCC Technology Readiness Rating: **NJTRAx Digital Learning Readiness Rating:**

Goal and Identified Need	Strategy to address Need	Activity/Task/Tactic **(Professional learning, resources, persons responsible to ensure completion. Identify timeline to revise and adjust plan)**	Evaluation/ Indicators	Budget Amount/Source
Example: NJ Core Curriculum Math Standards, middle school implementation to increase academic achievement for all subgroups	Example: Course called "Math Pedagogy made Simple" is available by district teacher trainers who present content while modeling the use of technology in the classroom. Focus on research for deeper learning from grade 4 through grade 7. (NRC 2012, p. 4)	Example: Grade level team allowed release time to develop next steps by principal-9-2016 through 6-2019: Wiki participation required by attendees within the week after PD to reflect and work on infusing what was learned signed off by principal Co-teaching begins 9-2016 within targeted grade level classrooms (grades 4 through 7) for added support to students as facilitated by curriculum director.	PARCC online assessment comparison scores; teacher in class assessment analysis; student mid-year self-assessment	$9,999 Federal-Title XX $9,999 State funding

Professional Learning Considerations

APPENDIX G

Professional Learning occurs for leadership teams and instructors. All must be knowledgeable about what occurs when teaching and learning occurs in a digital learning environment. Much of the information below originates in the NETP. The NETP provides diverse examples of professional learning events.

Professional Learning must be ongoing, high-quality, evidenced-based and personalized to meet the teacher's needs. [24] Identify the resources available to help the district provide opportunities to deliver high-quality learning experiences, digital resources and access to online courses taught by effective educators.

Teachers must be empowered to gauge their personal level of technology readiness that includes digital literacy skills, visual literacy skills and computational thinking skills. Teacher technology readiness growth should be tracked at the district level and school level to inform decisions on the district-wide professional learning needs of administrators and instructors.

There should be a consideration to providing unified professional learning opportunities with content area and educational and technology education educators, community members, national and international experts so that the effective integration of technology is evident, witnessed and practiced during the learning opportunity event.

Collaboration with experts outside of the school walls should be encouraged and fostered.

With this unified approach to professional development, there should be a concerted effort to develop a sense of "agency" for all students and to effectively use data resulting from the use of technology to inform instruction.

Sample Learning Models and Strategies

APPENDIX H

- Universal Design for Learning (UDL) Framework supports methods for delivering instruction and student activities. NJ Collaborative Education Team (NJCET) is a diverse group educators from the NJ Department of Education and school districts who has developed resources to assist districts and schools with effective implementation of UDL. More information about NJCET is found on the department's website. Instructors should know how to effectively implement all of the following instructional models so that the model may be employed regularly as part of the instructional process.
- Differentiated Instruction includes flexible assessment grouping and provides pathways for learning linked to student interests and needs.
- Personalized learning
- Cooperative and Collaborative Learning environments
- Using data to support learning
- Assess student digital literacy[25]
- Assess students for technology preparedness by meeting Standard 8.0 (includes 8.1 and 8.2)
- Familiarizing students with functionality of devices used for PARCC online assessments
- Blended Learning Models [26]
- Gaming, Simulations, connecting physical and virtual interactions with learning technologies, interactive three-dimensional imaging software, and augmented reality (AR).

Please note: definitions of terms noted above may be found in the Digital Learning Glossary of Terms found on the Educational Technology web page.

Technology Planning For Digital Learning Process

APPENDIX I

An Effective Digital Learning Plan

A.

A. What does your district/school have now to address the vision?

Review infrastructure, instructional needs assessment, investigation and identfication.

VISION

B.

B. What does the district/school need to support the vision?

Continue needs assessment using resources such as NJTRAx technology readiness system; NJTRAx Digital Learning Surveys (administrator, parent, teacher, student, technology leaders)

C.

C. What Goals , Strategies and Objectives will lead to meeting the identified instructional needs?

Equitable physical and logistical access to devices based on adopted instructional models.

D.

D. How will the goals and objectives be achieved?

Three-year Action Plan with indicators that include the cyclical process below.

For A. and B. consider:

Leadership (Multi-tiered systems of support)

District and School Level Infrastructure (connectivity, facilities), Technical Support and Policies

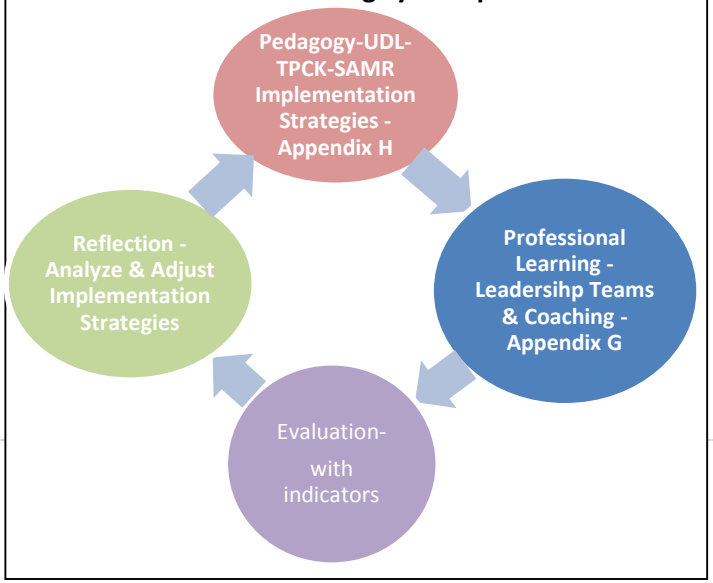
District and Building Culture for technology infusion

Curriculum Alignment to Standard 8.1, 8.2 and other core curriculum content standards- consider the TPACK framework, SAMR model, Universal Design for Learning (UDL) framework, and the Daggett System for Effective Instruction and Innovative Approaches

Formative and Summative Evaluation

Professional Learning

For D. consider the following cyclical process:



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- Dale Breault, Director, Northeastern Regional Information Center, Albany, NY.
- International Society for Technology Education (ISTE) Commons Community, *Food for Thought: ISTE Standard Refresh.*
- Len Scrogan, Digital Learning Architect, University of Colorado-Denver, Future-Talk 3D Blog: http://future-talk.net
- NJ Department of Education County Office Education Specialists

END NOTES

1. NJ initiatives – more information
   a. http://www.mresc.k12.nj.us/pages/Middlesex_Regional/News/DRLAP_Broadband_Component
   b. www.njdigitallearning.org
2. Steven Anderson's blog - http://blog.web20classroom.org/2015/08/a-more-holistic-approach-to-technology.html
3. National Educational Technology Plan (NETP) - http://tech.ed.gov/netp/introduction/
4. NETP- http://tech.ed.gov/netp/introduction/
5. A discussion on the importance of soft skills can be found at: US News & World Report http://www.usnews.com/education/blogs/college-admissions-playbook/2014/05/12/hone-the-top-5-soft-skills-every-college-student-needs
6. Digital Use Divide explained in NETP - http://tech.ed.gov/netp/learning/
7. Homework Gap explained in NETP-http://tech.ed.gov/netp/infrastructure/
8. Northeastern Regional Information Center (NERIC) - http://neric.org/Smart_Schools/PDFs/Transforming_Schools.pdf., p. 2
9. Gayle Allen, "Four Ways to Move from School World to Real World", www.BrightBytes.net, p.5
10. District Infrastructure: NERIC-http://neric.org/Smart_Schools/PDFs/Transforming_Schools.pdf., pp. 2, 10 through 13
11. Curriculum, Pedagogy and Teaching and Learning and Assessment: NERIC-http://neric.org/Smart_Schools/PDFs/Transforming_Schools.pdf., pp. 5 through 8
12. Willard R. Daggett, *The Daggett System for Effective Instruction – Where Research and Best Practices Meet*, June 2011-http://teacher.scholastic.com/products/scholastic-achievement-partners/downloads/Daggett_System_For_Effective_Instruction.pdf, p. 4
13. NERIC-http://neric.org/Smart_Schools/PDFs/Transforming_Schools.pdf., pp. 2 to 9
14. Teaching, Learning and Assessment: NERIC-http://neric.org/Smart_Schools/PDFs/Transforming_Schools.pdf.
15. Lindsey Layton, *Study: billions of dollars in annual teacher training is largely a waste*, August 4, 2011, Washington Post
16. Center for Applied Special Technology (CAST) adds further explanation to evaluating digital tools-http://castprofessionallearning.org/project/free-top-10-udl-tips-for-developing-learning-goals/), and Dreambox also has advice on evaluating digital curricula- *Best Practices for Evaluating Digital Curricula*- http://www.dreambox.com/white-papers/importance-selecting-digital-curricula, p.13; and http://www.dreambox.com/blog/importance-evaluating-digital-curricula-check-white-paper
17. An interesting resource is North Carolina's honors course rubric that includes questions to consider if looking for criteria to determine if students are thinking deeper, http://www.dpi.state.nc.us/docs/cit/home/honorscourse.pdf)
18. Gayle Allen, "Four Ways to Move from School World to Real World", www.BrightBytes.net

19. An example of an active Professional Learning Network that is outside of the United States is the European Distance and E-Learning Network-EDEN-http://www.eden-online.org/professional-community.html
20. Willard R. Daggett, *The Daggett System for Effective Instruction – Where Research and Best Practices Meet*, June 2011-http://teacher.scholastic.com/products/scholastic-achievement-partners/downloads/Daggett_System_For_Effective_Instruction.pdf
21. Tim Hudson, PhD., http://www.dreambox.com/white-papers/importance-selecting-digital-curricula, p.6
22. The Office of Educational Technology's Standard 8 Assessment Toolkit includes a rubric and checklist that details what students need to understand and be able to accomplish in regard to the standards 8.1 and 8.2
23. NERIC-http://neric.org/Smart_Schools/PDFs/Transforming_Schools.pdf, p. 2
24. *Building Your Roadmap to 21st Century Learning Environments*-http://www.roadmap21.org/leadership.html, p. 62
25. Extensive discussion on digital literacy found at NETP: http://tech.ed.gov/netp/teaching/ and ESSA-https://www.gpo.gov/fdsys/pkg/BILLS-114s1177enr/xml/BILLS-114s1177enr.xml#toc-H7AFDC582858549EDAF68D78601B47A31
26. ESSA- https://www.gpo.gov/fdsys/pkg/BILLS-114s1177enr/xml/BILLS-114s1177enr.xml#toc-H7AFDC582858549EDAF68D78601B47A31